A Nuclear Power plant aboard a US Nuclear Submarine be also classified as a "small Modular Reactor according to Trumps latest initiative

Yes — **technically, a U.S. nuclear submarine reactor could fit the broad physical definition of a "small modular reactor," but that does *not* mean the U.S. government would automatically classify a submarine reactor as an SMR under President Trump's current initiatives.**

I checked the current 2026 DOE material because the distinction matters.

Why it could qualify technically

The IAEA generally describes an SMR as a reactor producing **up to about 300 MWe per module**, with systems/components designed for modular or factory fabrication. Importantly, the IAEA explicitly recognizes **marine-based light-water SMRs** as a category.

Nucleus +1

A modern U.S. submarine reactor is:

- physically compact;
- factory-built to a significant degree;
- a self-contained reactor plant;
- designed for very high reliability;
- capable of operating for long periods without refueling;
- substantially smaller in electrical output than conventional commercial reactors.

So, **from an engineering/classification standpoint, there is a strong argument that a naval reactor is "SMR-like."**

But Trump's initiative is narrower

The current Trump administration's nuclear program is principally aimed at **commercial/advanced reactors and civilian electricity generation**, not simply every reactor below 300 MWe.

For example, DOE's current SMR program is supporting **advanced light-water SMRs for U.S. commercial deployment**, including projects intended to put electricity onto the civilian grid. The Dep... +1

And the administration's broader nuclear initiative has accelerated advanced-reactor demonstrations, including three microreactor designs reaching criticality in June 2026 under DOE's Reactor Pilot Program. The Department ...

So there's an important distinction:

> **"Could a submarine reactor meet the technical characteristics of an SMR?" — Yes, potentially.**
> **"Would the Navy's existing submarine reactors automatically count as SMRs for Trump's civilian SMR programs?" — No.**

The really interesting possibility

There is, however, a **much more interesting policy argument** here.

The Navy has decades of experience designing extremely compact, rugged pressurized-water reactors. If the government were to say:

> *Take mature naval nuclear-reactor technology, remove the military-specific requirements, adapt it for civilian deployment, and manufacture the reactor modules using the existing naval nuclear supply chain...*

that could potentially become a **very powerful pathway toward American SMRs**.

In fact, the IAEA's definition does not require an SMR to be land-based; it specifically notes that LWR-SMRs can be **land- or marine-based**. Nucleus

The obstacle is that a **naval reactor isn't simply a commercial SMR sitting inside a submarine**. Naval reactors have different requirements concerning shielding, shock resistance, acoustic signatures, compactness, weapons/mission survivability, crew arrangements, fuel, security, and classified technology. Those requirements can make them *more* expensive and technically sophisticated than what a commercial SMR needs.

So I'd characterize it this way:

Submarine reactor → technically within the broad SMR family in some respects → not automatically a Trump-program SMR → naval reactor technology could potentially be adapted into a civilian SMR platform.

And that last possibility is particularly interesting because Trump's current program is simultaneously pushing **SMRs, microreactors, domestic nuclear manufacturing, and rapid reactor deployment**. The Department ...

If you're thinking about this as a **policy proposal—essentially "use the U.S. Navy's submarine-reactor industrial base as the foundation for a new generation of civilian SMRs"**—that's a considerably more interesting proposition than simply re-labeling submarine reactors as SMRs.

Sources

> Why not use the U.S. Navy's submarine-reactor industrial base as the foundation for a new generation of civilian SMRs

I think there is a **very strong case for doing exactly that—but not by simply transferring a submarine reactor into a civilian power plant.** The better strategy would be to transfer the **industrial system, manufacturing discipline, workforce, testing capability, and selected reactor technologies** that make Naval Reactors successful.

The timing is particularly interesting because the Trump administration is now explicitly trying to rebuild the U.S. nuclear industrial base and accelerate SMR deployment. DOE has already committed funding for advanced light-water SMRs and is working on the domestic nuclear supply chain. The Department ... +2

What the Navy already has that civilian nuclear lacks

The U.S. submarine program has something extraordinarily valuable: **a proven nuclear manufacturing ecosystem.**

The submarine industrial base involves roughly **16,000 suppliers across all 50 states**, along with laboratories and research facilities. The two nuclear-capable shipyards are General Dynamics Electric Boat and HII Newport News. Congress.g...

And Naval Reactors is not merely a reactor designer. It has **cradle-to-grave responsibility** for naval nuclear propulsion—design, engineering, fuel, components, testing, operation and spent fuel management. Governme...

That is precisely the sort of institutional capability the civilian nuclear industry has struggled to maintain.

So instead of asking:

> **"How do we invent another SMR?"**

I'd ask:

> **"How do we convert America's naval nuclear manufacturing advantage into a civilian SMR manufacturing advantage?"**

That's a much more interesting question.

The model I would pursue

I'd create something like a **"Naval-to-Civilian Nuclear Manufacturing Initiative."**

Not transferring classified Navy technology. Rather, establish a government-industry program that takes the **non-classified manufacturing and engineering practices** developed through the Naval Nuclear Propulsion Program and applies them to a purpose-built civilian reactor.

1. Keep Naval Reactors separate

This is critical.

I wouldn't ask Naval Reactors to become a commercial reactor company.

Its mission is national security, and its reactor designs have requirements that make little sense for a civilian plant—extreme compactness, shock resistance, long core life, etc.

Instead, establish a **civilian reactor program alongside it**, perhaps under DOE, while allowing carefully controlled transfer of non-sensitive expertise.

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2. Design a "civilianized naval-style" reactor

The goal wouldn't be:

Virginia-class reactor → commercial reactor

It would be:

Naval engineering philosophy → purpose-built civilian SMR

For example:

- conventional civilian fuel;
- civilian pressure vessel;
- civilian steam cycle;
- simplified maintenance;
- replaceable/refuelable core;
- much less stringent shock/weight requirements;
- conventional containment;
- standardized plant interfaces.

A congressional hearing has previously noted that a submarine reactor could in principle be adapted for commercial use, but that naval cores are optimized for combat conditions and long-life operation, making direct commercialization economically unattractive. Congress.gov

That's actually an argument **for** your idea—not against it.

Don't commercialize the submarine reactor.

Commercialize the manufacturing philosophy.

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3. Build a standardized reactor factory

This could be the biggest payoff.

Instead of constructing each nuclear plant as a unique megaproject, establish a production line for standardized reactor modules.

Think of it more like:

Ford/aircraft/submarine production philosophy

rather than:

one-off construction project.

The reactor vessel, steam generators, pumps, control systems and other modules could be manufactured under controlled factory conditions and transported to sites.

That's very compatible with the fundamental SMR concept. GAO defines SMRs as reactors below roughly 300 MWe and has noted the potential advantages of modular manufacturing. U.S. G...

And there's an even bigger opportunity: the workforce

This may actually be more important than the reactor technology.

The U.S. is trying to simultaneously rebuild:

- nuclear engineers;
- welders;
- nuclear-grade machinists;
- reactor-component manufacturers;
- nuclear-qualified suppliers;
- inspectors;
- quality-assurance personnel;
- nuclear construction workers.

The submarine program already has an extraordinarily demanding nuclear-quality culture.

If civilian SMR production were deliberately tied into that ecosystem, you could create a **large, durable civilian nuclear workforce** rather than training people for one-off nuclear construction projects.

That would address one of the fundamental problems facing the U.S. nuclear renaissance: **you can't build dozens of reactors if you only have the industrial capacity to build one at a time.**

There is one enormous problem: fuel

This is where the idea becomes much more complicated.

U.S. naval propulsion has historically relied on **highly enriched uranium from the federal defense stockpile**, rather than the civilian commercial fuel cycle. Congress.gov

You obviously don't want civilian SMRs depending on the Navy's military fuel system.

So the civilian derivative would need to use an appropriate **commercial fuel cycle**, probably conventional LEU or potentially HALEU depending on the reactor design.

That means the Trump administration's effort to rebuild the domestic nuclear fuel cycle is actually complementary to your idea. DOE's current DPA initiative specifically targets mining, conversion, enrichment, fuel fabrication and related nuclear-fuel capabilities. The Department ...

In other words:

Naval industrial base + civilian fuel cycle + standardized reactor = potentially powerful combination.

There's another clever possibility

Don't restrict the program to electricity.

A naval-derived civilian SMR could potentially be designed around **multiple markets**:

Grid electricity

Perhaps 100–300 MWe.

Data centers

Dedicated nuclear power for AI/data-center campuses.

Industrial heat

Chemical processing, hydrogen, refining, etc.

Remote installations

Mining, Alaska, islands, military bases.

Desalination

Electricity + process heat.

That would give manufacturers multiple markets rather than betting everything on traditional utility-scale electricity.

And that's particularly relevant today because DOE explicitly identifies rapidly growing electricity demand from **data centers and AI** as a driver for SMR deployment.

The Department ...

The really interesting part

There is a potentially elegant division of labor:

Existing capability	New civilian role
Naval nuclear engineering culture	Civilian SMR engineering
Nuclear-qualified suppliers	SMR supply chain
Navy manufacturing QA	Civilian nuclear QA
Naval welding/machining expertise	Reactor manufacturing
DOE national laboratories	Civilian testing
Commercial utilities	Customers/operators
Civilian enrichment/fuel industry	SMR fuel
Private reactor companies	Reactor design
Existing shipyards/manufacturers	Module production

You wouldn't be **privatizing Naval Reactors**.

You'd be using the enormous public investment in America's naval nuclear ecosystem as a **launchpad for a second, civilian nuclear manufacturing ecosystem.**

And Trump's current policy creates an unusually good opening

DOE is already funding advanced light-water SMR deployment, with $900 million originally allocated for the program and additional 2026 funding aimed at addressing licensing, supply-chain and site-preparation barriers. The Department ... +1

Meanwhile, the administration's nuclear-industrial-base initiative is explicitly trying to rebuild domestic nuclear manufacturing and fuel capacity. The Department ...

So your proposal could actually be framed as:

> **Don't build a completely separate civilian nuclear industrial base from scratch. Use America's existing naval nuclear industrial base as the foundation, while keeping military technology and fuel completely segregated.**

That's a **much more defensible proposition** than saying, "Let's put submarine reactors on the civilian grid."

And I think there's a particularly compelling economic argument: **the Navy has already paid for decades of learning how to manufacture extremely demanding nuclear systems reliably. The civilian sector shouldn't have to relearn every lesson from zero.**

The challenge is designing the legal, security, procurement and technology-transfer boundary so that **Naval Reactors remains uncompromised while civilian industry gets the maximum benefit from the publicly funded ecosystem.**

If you want, I can take this one step further and sketch out **what a 150–300 MWe "American Naval-Derived SMR" program could actually look like—including estimated cost, deployment timeline, manufacturing locations, regulatory pathway, and how it could fit directly into Trump's 2030 nuclear goals.**

Sources

> sketch out **what a 150–300 MWe "American Naval-Derived SMR" program could actually look like—including estimated cost, deployment timeline, manufacturing locations, regulatory pathway, and how it could fit directly into Trump's 2030 nuclear goals**

Yes. If I were turning your idea into an actual federal program, I would **not** call it "commercializing a submarine reactor." I would call it something like the **American Naval Nuclear Manufacturing Initiative (ANNMI)**: use the U.S. naval nuclear ecosystem to create a standardized civilian 150–300 MWe reactor platform.

The key is to transfer **industrial capability and non-sensitive engineering practices**, not classified naval reactor designs.

I would structure it roughly as follows.

1. The target: a 250–300 MWe standardized PWR

I'd choose a **pressurized-water reactor (PWR)** rather than inventing an exotic reactor.

That has several advantages:

- The U.S. Navy has enormous PWR experience.
- The civilian U.S. industry already understands PWR technology.
- Existing nuclear operators understand PWR operations.
- Fuel would use the civilian commercial fuel cycle.
- The NRC already has regulatory experience with LWR/SMR designs.
- A 300-MWe class is already an established commercial target.

For comparison, Holtec's SMR-300 is a 300-MWe passive-safety PWR, and the NRC is already reviewing the project for potential deployment at Palisades. Nucl... +1

But the new reactor should not be a naval reactor.

It would be a new civilian design incorporating lessons from naval manufacturing.

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2. The central design philosophy

I'd give the program one overriding requirement:

Design the reactor around manufacturing, not manufacturing around the reactor.

That's where the submarine analogy becomes powerful.

Instead of designing an incredibly complicated nuclear plant and then asking contractors how to build it, the designers would work backwards from:

What can American factories repeatedly manufacture to nuclear-grade quality?

That means:

Standard reactor module → standard components → standard factory tooling → standard transportation → standard site installation → standard commissioning.

And then build **many identical units**.

That is the part of the naval model worth copying.

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3. I would actually create two versions

ANNMI-150

~150 MWe

Designed for:

- smaller utilities;
- industrial facilities;
- remote regions;
- military bases;
- replacement of retiring coal plants;
- smaller grids.

ANNMI-300

~300 MWe

Designed for:

- major utilities;
- data centers;
- manufacturing;
- chemical plants;
- large industrial customers;
- multi-reactor nuclear parks.

The 300-MWe version would probably become the main production model.

The goal should be perhaps 80% commonality between the two.

That allows the manufacturer to get the benefits of a product family without creating two completely separate reactors.

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4. Where would we build them?

This is where I think the proposal becomes particularly interesting.

I would establish **three manufacturing centers**, rather than putting everything into one location.

Center #1 — Connecticut/Rhode Island

Nuclear module engineering + precision manufacturing

The Electric Boat ecosystem already operates around Groton, Connecticut, and Quonset Point, Rhode Island. GAO identifies Electric Boat and Newport News as the two private

shipbuilders capable of constructing U.S. nuclear-powered submarines. Governme... +1

I'd establish a civilian SMR manufacturing campus somewhere in this broader Northeast industrial corridor.

Not inside the classified submarine facilities.

It would be a **parallel civilian facility**, potentially using suppliers and workforce developed through the naval ecosystem.

Center #2 — Virginia

Heavy nuclear-component manufacturing

Newport News/Hampton Roads is another obvious location because of its enormous nuclear shipbuilding infrastructure.

But again, the important concept is **adjacent ecosystem, not shared classified production.**

Center #3 — Gulf/Southeast

I'd establish a third major manufacturing cluster somewhere such as:

Louisiana / Mississippi / Alabama / Tennessee

This gives the program access to:

- lower-cost industrial land;
- ports;
- heavy manufacturing;
- Southern nuclear utilities;
- TVA;
- existing nuclear sites;
- a growing industrial workforce.

And it creates geographic redundancy.

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5. Don't build the reactors at the shipyards

This is an important distinction.

The shipyards should contribute:

- manufacturing expertise;
- QA systems;
- welding expertise;
- nuclear-grade procurement;
- supplier qualification;
- workforce training;
- production engineering.

But the actual civilian reactor factory should be **purpose-built**.

Think:

> **"Nuclear Airbus factory," not "submarine factory."**

The U.S. Navy's industrial base is already under significant capacity pressure. GAO reports that Electric Boat and Newport News have struggled with workforce and infrastructure capacity while simultaneously trying to increase submarine production. Government Acc...

So you absolutely **do not want SMRs competing with Virginia- and Columbia-class submarine production for factory space or labor.**

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6. The first demonstration plant

I'd build a **two-unit demonstration facility**.

2 × 300 MWe

600 MWe total

Location criteria:

1. Existing nuclear site.
2. Existing grid connection.
3. Existing cooling infrastructure.
4. Experienced nuclear workforce.
5. Host community already familiar with nuclear power.
6. Room for 4–8 additional units.

Palisades is an excellent example of the model because Holtec is already pursuing two SMR-300 units adjacent to the existing plant, and the NRC accepted the first part of its phased construction-permit application in February 2026. Nuclear Regulato...

But for the hypothetical ANNMI project, I'd want a **greenfield standardized demonstration**, rather than simply attaching the project to somebody else's design.

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7. Timeline

Here's the aggressive—but I think potentially achievable—schedule.

2026–2027 — Program establishment

Congress authorizes ANNMI.

DOE establishes the program office.

Navy/DOE/NRC create a formal firewall governing transfer of **non-classified** technology and manufacturing knowledge.

Private reactor company selected.

Target:

250–300 MWe PWR.

2027–2029 — Engineering

Complete:

- conceptual design;
- reactor physics;
- thermal hydraulics;
- safety analysis;
- preliminary PRA;
- fuel qualification;
- component qualification;
- factory design;
- supply-chain qualification.

Simultaneously begin NRC pre-application engagement.

This is particularly important because the NRC strongly encourages early regulatory engagement, and its current process explicitly allows applicants to establish regulatory engagement plans before submitting a license application. Nuclear Regulato...

2028–2030 — Factory construction

Build the first dedicated SMR manufacturing plant.

At the same time:

- qualify suppliers;
- build prototype components;
- establish nuclear-grade QA;
- train workforce;
- establish the civilian fuel contract.

2029–2031 — Licensing + first reactor construction

Here's where the regulatory environment has changed dramatically.

As of 2026, **NRC Part 53 is actually available for use**. It became effective April 29, 2026 and provides a technology-inclusive, risk-informed, performance-based licensing framework.

Nuclear Regulato...

I'd deliberately design the reactor to take advantage of that framework.

2031–2033 — First reactor criticality

ANNMI-300 Unit 1

Target:

2032–2033

That's aggressive.

But importantly, it isn't completely disconnected from the government's current trajectory: DOE is already supporting early SMR deployments expected in the early 2030s. Its TVA/Holtec program provides up to $800 million for projects in Tennessee and Michigan.

The Department ...

2033–2035 — Unit 2

Build the second reactor using lessons from Unit 1.

This is where the economics should start changing.

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8. Cost

This is the part where I would be deliberately conservative.

I would **not** promise a $2-billion reactor.

That's how nuclear projects get into trouble.

I'd establish three cost targets.

First-of-a-kind

$5–8 billion for a two-unit/600-MWe site

or approximately:

$8,300–$13,300/kW

That includes first-of-a-kind engineering, licensing, site infrastructure and contingency.

First commercial series

Units 3–10:

$3–5 billion per 300-MWe unit

Mature production

Units 10+:

$2–3.5 billion per 300-MWe unit

roughly:

$6,700–$11,700/kW

Those are **program targets, not forecasts**.

The economics depend enormously on financing, construction productivity and how much factory production actually reduces onsite work.

Current SMR projects show why we should be cautious. DOE is providing up to $800 million for early TVA/Holtec deployments, while the administration is also spending heavily to rebuild the nuclear supply chain. The Department ... +1

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9. Federal investment

I'd propose approximately:

Phase I

$2 billion

Design + licensing + factory development.

Phase II

$4–6 billion

First demonstration plant and manufacturing facility.

Phase III

$5–10 billion

Production incentives, loan guarantees and supply-chain financing.

So:

Total federal commitment:

~$11–18 billion over 8–10 years

But here's the important part:

The government shouldn't pay for all the reactors.

It should pay for the things private investors cannot economically justify before a market exists:

- first-of-a-kind engineering;
- licensing;
- factory tooling;
- workforce development;
- supplier qualification;
- demonstration plant;
- loan guarantees.

Then utilities, industrial companies and data-center operators finance subsequent units.

That's essentially the logic behind DOE's existing SMR deployment program. The Department ...

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10. Regulatory strategy

I'd use **NRC Part 53** as the default pathway.

The sequence would be:

DOE pre-application → NRC engagement → design certification/approval strategy → construction authorization → operating license

Part 53 is particularly interesting because it is technology-inclusive and risk-informed rather than prescribing the traditional regulatory architecture for every reactor. Nuclear Regulato...

I'd also make a huge effort to get the **standard design certified once**.

Then:

Reactor #1
Reactor #2
Reactor #3
Reactor #20

should all be essentially the **same certified machine**.

The NRC already has mechanisms for standard design approval/certification, which can prevent reopening the same design questions for every individual plant. Nuclear Regulato...
That is absolutely essential to the SMR business model.

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11. The fuel problem

This deserves its own program.

No Navy fuel.

The civilian reactor would use a commercially available civilian fuel specification.

I'd establish a parallel:

American SMR Fuel Program

DOE guarantees a long-term market for fuel suppliers willing to build:

conversion → enrichment → fuel fabrication

inside the United States.

This meshes remarkably well with what the administration is already doing: DOE announced $17.5 billion in financing for rebuilding the commercial nuclear supply chain, including long-lead components, and explicitly linked the effort to the goal of having 10 new large reactors with complete designs under construction by 2030. The Department ...

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12. The Trump 2030 connection

Here's where I'd make the proposal politically compelling.

Trump's current nuclear strategy isn't simply:

"Build some SMRs."

It is broader:

rebuild American nuclear manufacturing + accelerate reactor deployment + restore nuclear fuel production + reduce regulatory barriers + increase electricity supply.

DOE says the administration's current goal includes **10 new large nuclear reactors with complete designs under construction by 2030**, alongside the SMR and advanced-reactor initiatives. The Department ...

So ANNMI becomes the **SMR arm of the nuclear industrial-base strategy**.

I'd establish a 2030 scorecard:

Target	2030 objective
Standard reactor design	1
Certified reactor	1
Nuclear manufacturing plants	2–3
Qualified suppliers	200+
First demonstration site	Under construction
Reactor modules ordered	6–10
Workforce	10,000+ trained
Domestic fuel supply	Contracted
Commercial operating date	2032–33

13. And here's the really ambitious version

Once the first reactor works, don't stop at electricity.

I'd create **Nuclear Energy Parks**.

Imagine a site containing:

4 × 300 MWe = 1,200 MWe

of standardized reactors.

The same site could supply:

- 1.2 GW electricity;
- a data center;
- hydrogen production;
- industrial heat;
- desalination;
- synthetic fuels;
- semiconductor manufacturing.

That changes the business case dramatically.

Instead of selling:

> "electricity from a nuclear plant"

you're selling:

> **"a 1.2-GW guaranteed industrial energy platform."**

That could be particularly attractive to hyperscale data-center operators.

DOE itself says growing electricity demand from data centers, AI and industry is one of the drivers behind the current SMR push. The Department ...

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14. The most important thing I would *not* do

I would **not** put Naval Reactors in charge of the civilian program.

And I would **not** transfer classified submarine reactor designs.

Instead:

Navy

Protects classified technology and continues submarine propulsion.

DOE

Owns the civilian SMR industrial-base program.

NRC

Regulates the civilian reactor.

Private reactor company

Owns/designs the commercial reactor.

Electric Boat/Newport News ecosystem

Provides non-classified manufacturing/industrial expertise and supplier development.

National laboratories

Provide testing, modeling and materials expertise.

Utilities/data centers

Provide customers and private capital.

That separation protects national security **and** lets taxpayers capture the economic value of decades of naval nuclear investment.

My proposed end state

If it worked, by roughly **2035–2040** you'd want something like:

American SMR factory

↓

250–300 MWe standardized reactor

↓

Factory-produced modules

↓

Existing nuclear/industrial sites

↓

4–8 reactor parks

↓

1–2.4 GW per site

↓

repeat across the country

And eventually:

10 sites × 1.2 GW = 12 GW

from standardized American SMRs.

Then the really important metric isn't the first reactor.

It's whether **reactor #20 costs substantially less and takes substantially less time than reactor #1.**

That's the whole bet.

The strategic argument

I would pitch the proposal to Congress in one sentence:

> **"America already possesses the world's most sophisticated nuclear naval industrial base; rather than recreate that capability from scratch for civilian SMRs, create a parallel civilian manufacturing ecosystem that converts its non-classified lessons, suppliers, workforce and production discipline into standardized American reactors."**

There is a very real opportunity here—but also a warning. **GAO's recent work shows that the Navy's own shipbuilding industrial base is suffering from workforce and infrastructure constraints.** Government Acc... So the civilian SMR program must be designed to *expand* that industrial capacity, not cannibalize the submarine program.

And that's why I'd make the first major investment **not a reactor.**

I'd make it a **factory + workforce + supply-chain program**, with the reactor being the product that eventually rolls out of it.

That is, in my view, the most plausible way your original idea could become a serious **Trump-era 2030 nuclear-industrial policy**, rather than just an interesting analogy between submarine reactors and SMRs.

Sources

ChatGPT is AI and can make mistakes.